

tenement near the river, are capable of realising and appreciating the contrast between the present and the past in respect to the status of science and art in the City of Palaces. The change was great enough when the Chowringhi "jadu-gahr" (home of magic), as the Indian Museum is invariably termed by Bengalis, was first opened during the later 'seventies, but the present enlarged building, as photographed in the volume before me, with its additional upper storey and doubled frontage, renders the original structure almost a doll's house in comparison, magnificent and spacious as it was thought to be at the time when the present writer assisted in arranging the galleries.

In housing in this magnificent and lavish style the valuable collections illustrating the natural history, geology, archæology, and ethnology of British India, the Indian Government has done its duty in a manner worthy of all praise. Whether, however, the attempt to make the museum a great centre of educational instruction in biology will ever be realised, seems, to quote from the admirable account of the rise and history of the collections given by the Hon. Justice Sir A. Mookerjee in the introduction to the volume, more than doubtful. The introduction is followed by accounts of the various departments of the museum, all written in a style which renders the volume a model of what a work of this nature should be, and a credit to all those concerned in its production. R. L.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

The Colon as a Symbol for Ratio and Division.

In 1902 Prof. W. W. Beman, of the University of Michigan, pointed out ("L'Intermédiaire des mathématiciens," T.9, Paris, p. 229, question 2424), that the colon (:) occurs as a designation of geometric ratio at the end of the trigonometric and logarithmic tables published, together with William Oughtred's "Trigonometria" of 1657. Beman inquires whether this symbol for geometric ratio has a still earlier date.

Before answering this question we remark that it is highly improbable that the colon occurring in those tables was inserted by Oughtred himself; in the "Trigonometria" proper the colon does not occur, and Oughtred's regular notation for ratio and proportion, $A:B::C:D$, is followed throughout.

In the English edition of Oughtred's "Trigonometrie," printed in the same year, 1657, but subsequent to the Latin edition, the passage of the Latin edition containing the : is recast, the new notation for ratio is abandoned and Oughtred's regular notation introduced.

In Oughtred's posthumous "Opuscula mathematica hactenus inedita" (Oxford, 1677), the colon (:) is used frequently, but it may have been introduced by the editor of the book.

In answer to Beman's inquiry, we remark that the colon (:) was used to designate geometric ratio some years before 1657 by at least two authors, Vincent Wing, the astronomer, and a schoolmaster who hides

himself behind the initials "R. B." Wing wrote several works. In 1649 he published in London his "Urania Practica," which, however, exhibits no special symbolism for proportion. But his "Harmonicon Coeleste" (London, 1651) contains many times Oughtred's notation $A:B::C:D$, and many times also the new notation, $A:B::C:D$, the two notations being used interchangeably. Later there appeared from his pen, in London, three books in one volume, the "Logistica astronomica" (1656), "Doctrina spherica" (1655), and "Doctrina theórica" (1655), each of which uses the notation, $A:B::C:D$.

The book by the second author is entitled "An Idea of Arithmetick at first designed for the use of the Free Schoole at Thurlow in Suffolk . . . by R. B., Schoolmaster there" (London, 1655). One finds in this text $1.6::4.24$, and also $A:a::C:c$.

It is worthy of notice also, that in a text entitled "Johnsons Arithmetick, in Two Bookes" (second edition, London, 1633), the colon (:) is used to designate a fraction. Thus, $\frac{3}{4}$ is written $3:4$. If a fraction be considered as an indicated division, then we have here the use of : for division, at a period fifty-one years before Leibniz first employed it for that purpose. However, division dissociated from the idea of a fraction is not designated by any symbol in Johnson's text. In dividing 8976 by 15, he writes the quotient $598 \ 6:15$.

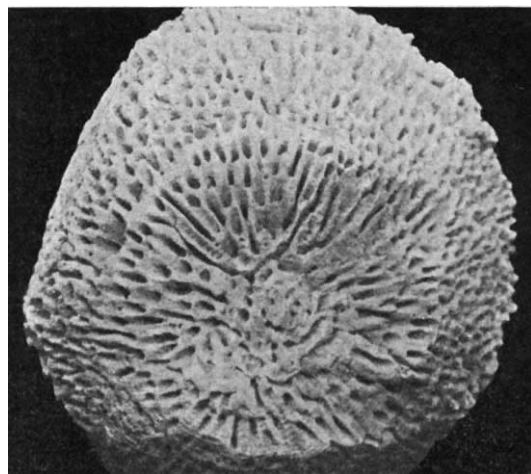
FLORIAN CAJORI.

London, December 23, 1914.

Is "Atikokania lawsoni" a Concretion?

HAS a mistake not been made in Memoir No. 28 of the Geological Survey of Canada? Dr. C. D. Walcott therein describes certain silicified structures in the Steeprock Limestone of Lake Ontario which he names *Atikokania lawsoni*. He considers they represent "a group of organisms related to the sponges," or else corals like the *Archæocyathinae*.

He appears to have relied on three of their features: (1) a central cavity; (2) the general form, including an



Coralloid mass from the 17-in. "Flag" bed. Fulwell Hill Quarry. $\times \frac{1}{2}$.

inner and outer wall, with (3) radiating tubes with septæ. Unfortunately they possess "no structural details." I suppose the author was unacquainted with the characters met with in the Magnesian Limestone of Fulwell Hill, Sunderland, where the forms are entirely due to segregation or to osmotic influence. His illustrations have a remarkable resemblance to much seen there in what I designate coralloid—a specimen of which is shown in the accompanying figure.

These have often solid centres like those in his Fig. 5, plate 1; the bands also resemble the irregular septa in his *Atikokania*. Without any traces of spicules it seems to me very doubtful indeed that these bodies have any organic origin, especially as it seems clear that changes in rocks after deposition lead sometimes to the formation of tubes. If my conclusions are correct, this in the Fulwell coralloids is certainly a very common development in the almost universal rod formation there. The change appears to be the result of the adherence of small circular groups of rods around a central canal; with so much of such material—there are at least two square miles of it some 130 ft. thick—the cause, whatever it may be, seems unconnected with either erosion, hydration, dolomitisation, metasomatism, or organic remains.

I have also seen tubes of this kind in a few other calcareous rocks, but the most common banded formation (probably allied to the septæ in Dr. Walcott's specimens) is seen in weathered mortar found in the shady parts of old buildings, especially those situated near the coast.

GEORGE ABBOTT.

2 Rusthall Park, Tunbridge Wells, November 18.

WHEN your letter of November 23, 1914, enclosing a note by Mr. George Abbott on the silicified structures described in Memoir No. 28 of the Geological Survey of Canada as *Atikokania lawsoni*, reached me on December 8, I had on my table a copy of NATURE of January 29, 1914, containing the note on "Zonal Structure in Colloids," by Mr. Abbott. Prior to meeting with this article, I did not know of the remarkable structure of the Sunderland Magnesian Limestone, or I should have certainly directed attention to it.

During the past summer I made large collections of supposed algal remains from the pre-Cambrian rocks in the Rocky Mountains of Montana. Some of these appear to be of undoubted organic origin. Others appear to be a combination of algal deposits in connection with concretionary consolidation.

The subject is now under investigation, and in this connection I shall take up the forms that I called *Atikokania*. With present information I should *not* be inclined to refer the latter to the sponges or to the *Archæocyathinae*.

CHARLES D. WALCOTT.

Smithsonian Institution, Washington, U.S.A.,

December 9.

A HISTORY OF BRITISH BIRDS.¹

WE have already noticed the first four parts of this comprehensive publication, and the general scope of the work and the plan on which it is carried out need not be more than briefly referred to here. We now welcome the twelfth and concluding section of the work and the last of its attractive and fascinating pages.

The book claims to be the only existing work which gives an adequate account of the habits of all our species of birds, except those so rare that they cannot be said to have, as British birds, any habits worth describing. These latter are treated shortly at the end of the last volume. It claims also that it brings together from every source, British and foreign, the whole available information on the subject, and presents it in a

form interesting alike to the specialist and the general reader. In showing what is known and what has yet to be found out about the habits of our birds, and in laying stress on the scientific problems which underlie the facts, the work stands alone in giving to the serious student of bird-life starting-points for further research. Though not professing to do more than supply summaries of the geographical distribution of all the species, the work claims to give recent information under this head which is not to be found in any other book on British birds.

It would be unjust to the contributors to these volumes if the impression arose that they had been merely content to compile the observations of others. For while it is true that in more than one case contributors to this book have found



Photo.]

FIG. 1.—Lapwing's nest. From "The British Bird Book." [W. Farren.

themselves in the very unsatisfactory position of having to write about species of which they had little personal knowledge, there is much information in the book that is the result of direct personal observation, and much, again, of this information could have been supplied only by the contributors and by no one else. Among them we have only to name the Rev. F. C. R. Jourdain, who, in search of eggs, has travelled over so much of Europe and the adjacent countries, and Mr. William Farren, to show how much valuable original observation the editor has had to draw upon among his various contributors. As the editor points out, too, though the bird-man who has concentrated his attention on a few species

¹ "The British Bird Book." Edited by F. B. Kirkman. Sections V—XII. (London and Edinburgh: T. C. and E. C. Jack, n.d.) Price 10s. 6d. net, per section.